

CLAIMS

1. A combustion system (10) for a gas turbine equipped with a premixing chamber (12) for air which is mixed with the fuel injected from a series of holes (11) creating a main central flame which is formed in a flame tube (14), said premixing chamber (12) is convergent towards a connection end with a combustion chamber comprising the flame tube (14), characterized in that said combustion system (10) comprises a series of pilot devices (20) with premixing of the fuel gas, which create a series of corresponding pilot flames suitable for stabilizing the main central flame itself, at the same time reducing the polluting emissions.
2. The combustion system (10) with low polluting emissions according to claim 1, characterized in that said flame tube (14) comprises a tapered connection end (15) to the air premixing chamber (12) and in that said tapered end (15) comprises a series of holes (18) each housing a respective pilot device of the series of fuel gas premixing pilot devices (20).
3. The combustion system (10) with low polluting emissions according to claim 1, characterized in that the holes of the series of holes (18) are positioned at an equal distance along a circumference of the tapered end

(15) of the flame tube (14) coaxial with its axis.

4. The combustion system (10) with low polluting emissions according to claim 1 or 2 or 3, characterized in that it comprises a series of thermocouples (19) outside
5 the central body (17).

5. The combustion system (10) with low polluting emissions according to claim 1 or 2 or 3, characterized in that it comprises a feeding duct (70) of the fuel, which surrounds said central body (17).

10 6. The combustion system (10) with low polluting emissions according to claim 1 or 2 or 3, characterized in that each pilot device of said series of pilot devices (20) with premixing of the fuel gas comprises a premixing duct (29), a series of holes (28) for the fuel gas inside
15 the premixing duct (29) and a unit (24) comprising at least one shaped element so as to create turbulence in the air flow in order to obtain a homogenous mixture of air/fuel gas inside the premixing chamber (29) itself.

7. The combustion system (10) according to claim 6,
20 characterized in that said at least one shaped element comprises a series of shaped blades (27).

8. The combustion system (10) according to claim 6, characterized in that said at least one shaped element comprises two series of shaped blades (25).

25 9. The combustion system (10) according to claim 7,

characterized in that each pilot device of the series of fuel gas premixing pilot devices (20) comprises a duct (43) for the fuel gas, situated in a central element (42) inside the premixing chamber (29) for stabilizing the flame of the pilot device itself, said duct (43) is inside and coaxial to an annular duct (34) for the fuel gas in turn connected to the series of holes (28).

10. The combustion system (10) according to claim 9, characterized in that each pilot device of the series of fuel gas premixing pilot devices (20) comprises two ducts (32) inside the premixing duct (29) for detecting the flow-rate of the fluid inside the pilot device itself and at least one thermocouple (33).

11. The combustion system (10) according to claim 7, characterized in that each pilot device of the series of fuel gas premixing pilot devices (20) comprises a mini-burner (45) inside the premixing duct (29) for stabilizing the flame of the pilot device itself.

12. The combustion system (10) according to claim 10, characterized in that the mini-burner (45) comprises a series of holes (35) for the air and characterized in that the mini-burner (45) is connected to a duct (43), for the fuel gas, inside and coaxial to an annular duct (34) for the fuel gas, in turn connected to the series of holes (28).

13. The combustion system (10) according to claim 8, characterized in that each pilot device of the series of fuel gas premixing pilot devices (20) comprises a series of holes (30) outside the premixing chamber (29) for stabilizing the flame of the pilot device itself.

14. The combustion system (10) according to claim 13, characterized in that each pilot device of the series of fuel gas premixing pilot devices (20) comprises a duct (37) connected to the series of external holes (30) and a duct (36) connected to the series of holes (28).

15. The combustion system (10) according to claim 8 or 11, characterized in that each pilot device of the series of fuel gas premixing pilot devices (20) comprises at least one thermocouple (33) and two ducts (32) inside the premixing duct (29).

16. The combustion system (10) according to any of the previous claims, characterized in that said combustion system (10) comprises a duct (60) for feeding air to the series of premixing pilot devices (20).

17. A combustion system (10) as previously described and illustrated and for the purposes specified above.